Productivity and Risk

Outline

- Projects for customers old and new
  - National Commodity Crop Productivity Index
  - National Commodity Crop Productivity Index (Irrigated)
  - National Biomass Productivity Index (Lowland Switchgrass)
  - Stormwater Management Suite

- National Commodity Crop Productivity Index (NCCPI) uses NASIS data to array soils based on their inherent properties
- Dryland (non-irrigated) soils
- Have the data for the US
- Maps are available on Soil Survey Atlas site, when it is visible again

- A need exists to array soils based on their productivity when irrigated.
- Irrigated National Commodity Crop Productivity Index under development.
- Should see a National Bulletin to ask for your help and input.

- Biofuels are of interest
- National Biomass Productivity Index (Lowland Switchgrass) in conjunction with Patrick Drohan at Penn State.
- Uses a similar process as NCCPI.

- NCCPI addresses the positive aspects of soil productivity.
- Using a soil to produce a commodity crop entails some level of risk to the environment.
- Environmental Risk of Commodity Crop Production looks at what can go wrong.

Philosophy – What Can Go Wrong?

- Three main detrimental effects:
  - Surface water contamination
  - Ground water contamination
  - In-situ degradation

Surface Water Degradation

- Rapid runoff
- Slope
- K factor
- Slope shape
- Precipitation sufficient for runoff
- Artificial drainage
- Flooding

Groundwater Contamination

- Rapid water movement (high Ksat through profile)
- Availability of leaching water (adequate precipitation to move material through)
- Low cation exchange capacity

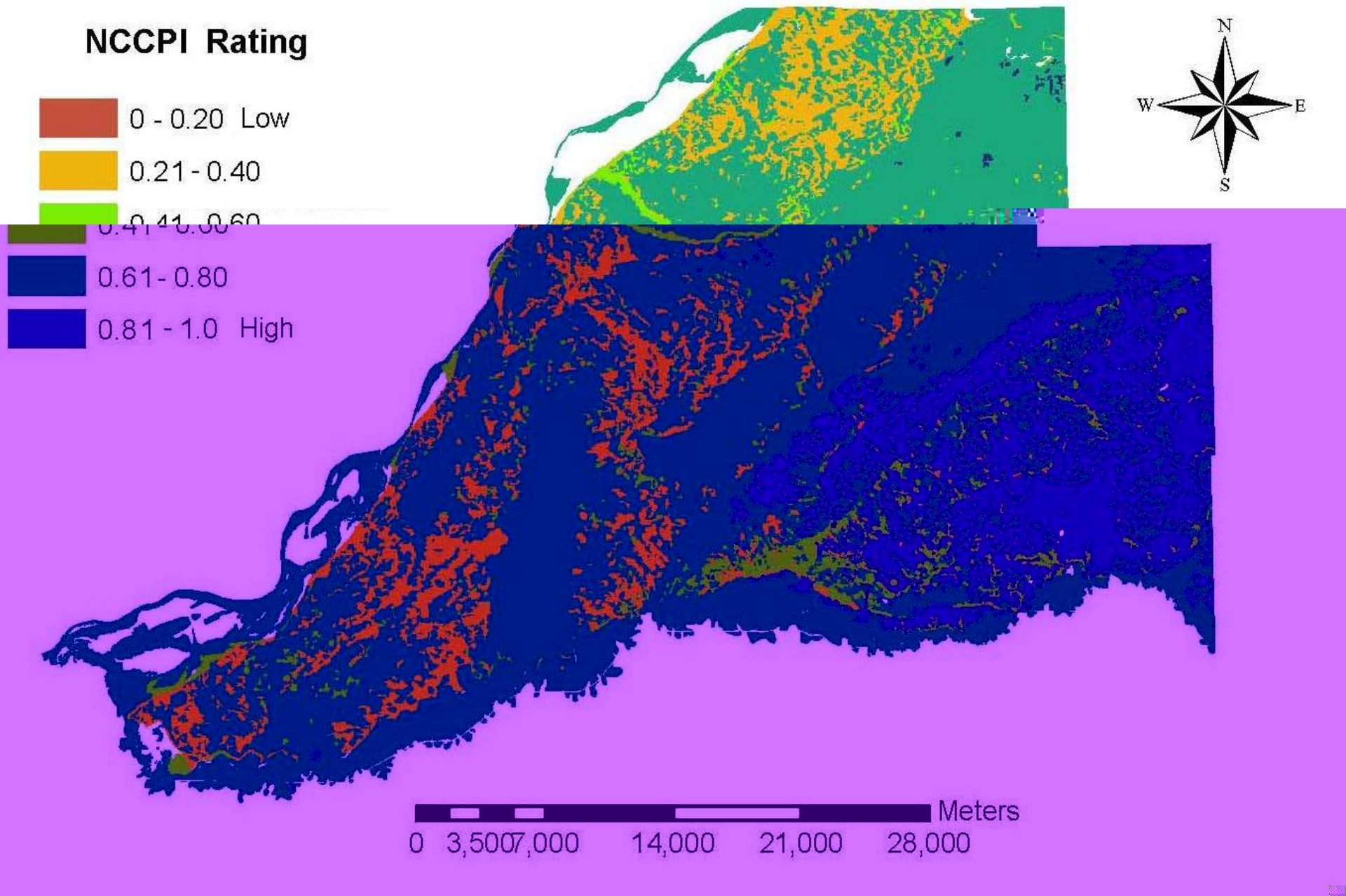
In-situ Degradation (Dynamic Soil Properties)

- Water erosion
- Wind erosion
- Compaction
- Organic matter loss sensitivity
- Salinization
- Acidification
- Nitrogen loss
- …

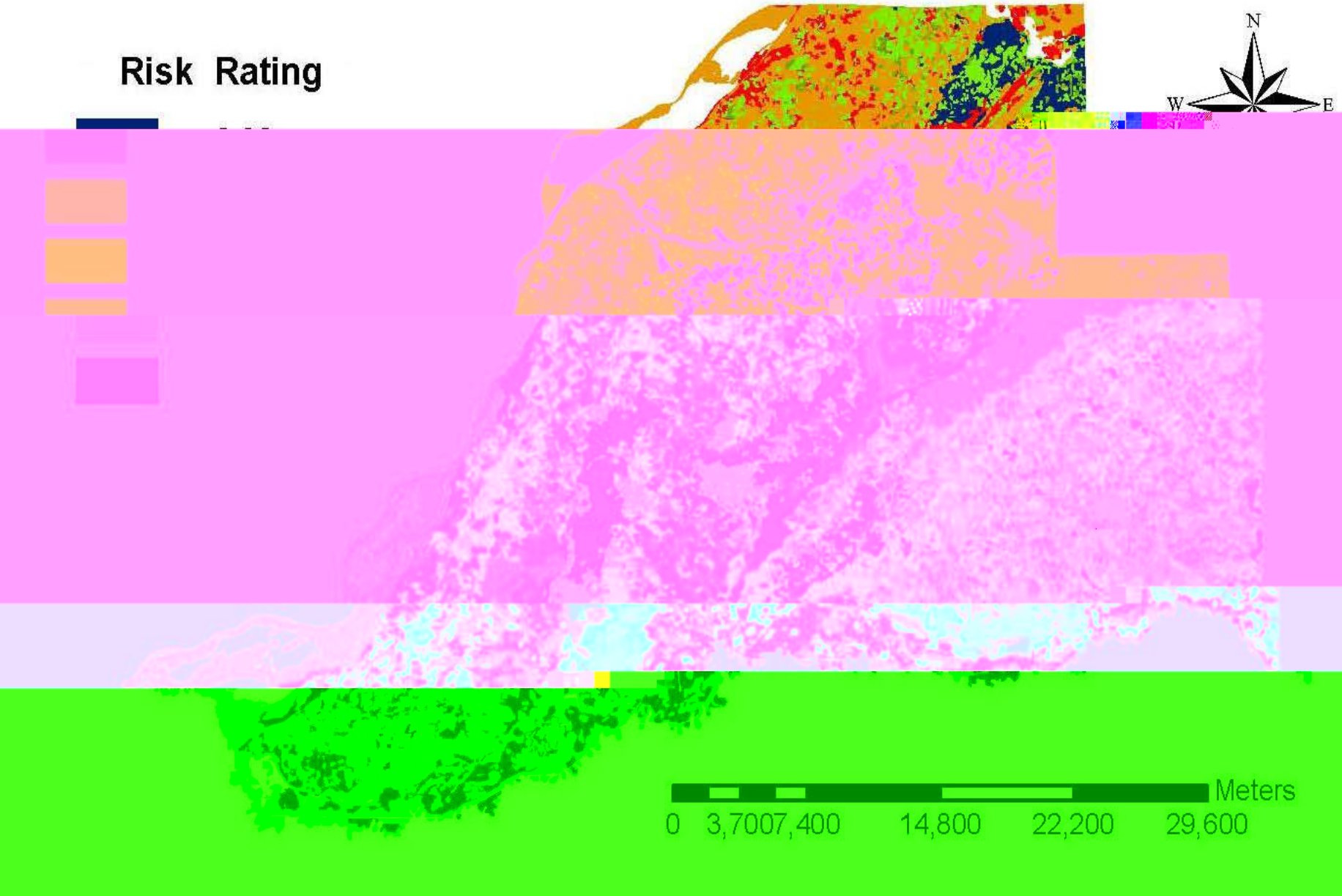
Environmental Risk Index

- Challenges
  - Most of these issues can be overcome by good management
  - Balancing the relative impact of the factors

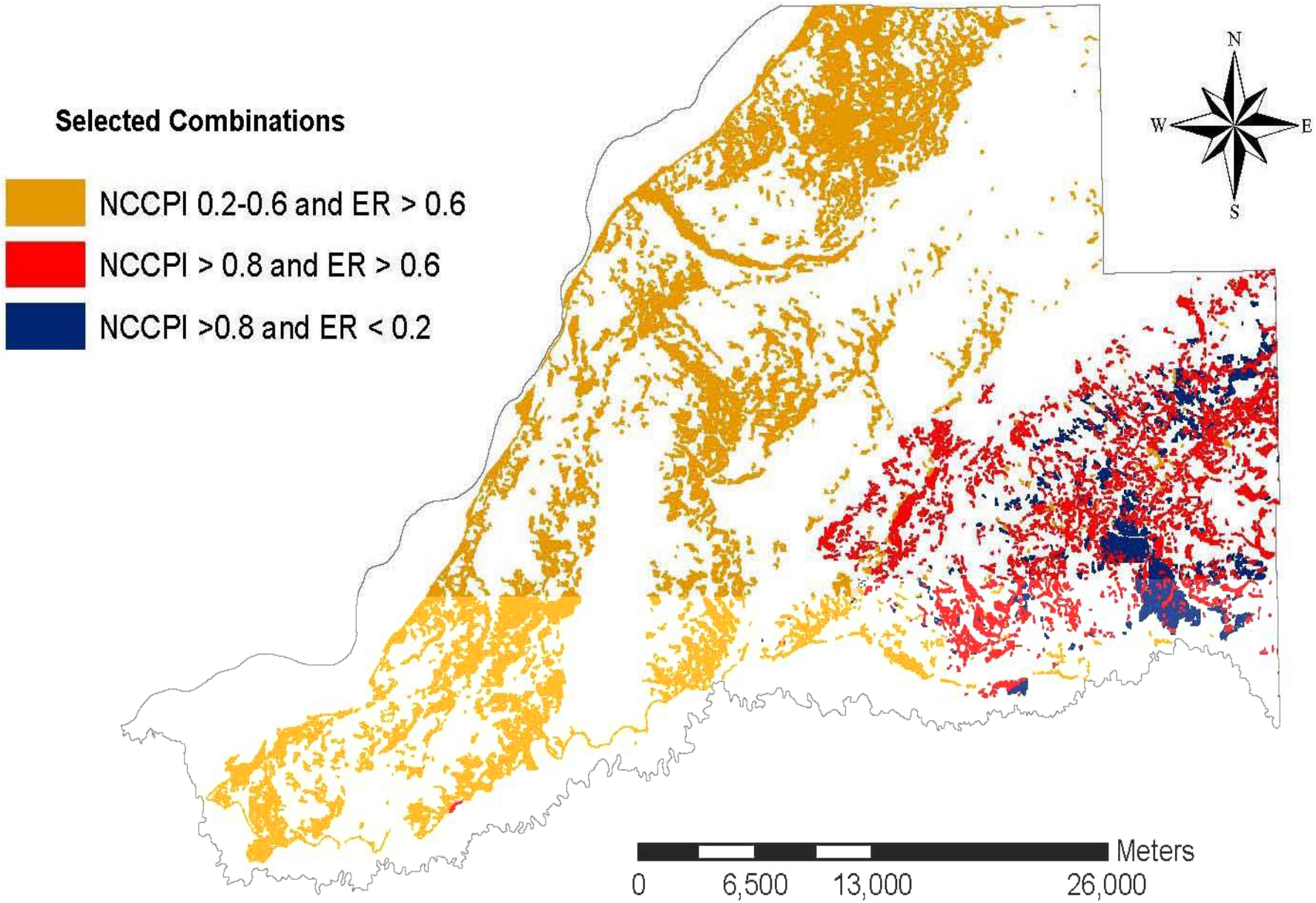
Mason County, IL NCCPI



Mason County, IL Risk Rating



Mason County, IL NCCPI and ER



Stormwater Management

- WV DEP and ARS working with WV NRCS, University of Akron, VA Tech and NSSC
- Many types of stormwater management practices
- Interpretations for three basic types:
  - Deep infiltration – rain garden
  - Shallow infiltration – pervious pavement
  - Retention – intermittent wetland

Stormwater Management

Special Considerations for Appalachia:

Karst – must be very careful not to exacerbate solution cavern formation – but at the same time these areas cannot be excluded

Slope Stability – slope is the dominant limiting feature so sloping areas (up to 20 percent) cannot be excluded, but clayey sloping soils can move

Jefferson County, WV
Stormwater Management